

THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR METALS

Volume IX

JANUARY, 1936

No. 1

**New Haven Mixes
Plant Trip, Party
& Technical Talk***Reported by L. E. Raymond*

New Haven Chapter, Dec. 19—On this date the doors of the Singer Mfg. Co.'s plant in Bridgeport were thrown open for a meeting and Christmas party. Events began about 1:45 p. m. when Al Pollard found it necessary to use the entire facilities of the Southern New England Telephone Co. in an effort to convince the officials of Orange that when a man slows down from 80 to 65 miles per hour in passing through their town on his way to an A.S.M. meeting he is using extreme caution.

At 2:00 p. m. the first group started through the factory, followed by two other groups at 10-min. intervals. The members inspected the hook and bobbin case manufacturing department, the button hole machine assembling and testing department, the cast iron milling department and the assembly and testing departments for high speed sewing machines, and finally landed in the heat treating department in time to see the heats being removed from the furnaces.

At four o'clock the members repaired to the Singer Club for an informal bowling contest. The ability of Henry Keshian to make a strike whenever needed was remarked upon and an inspection of the pit made to see if the pin boys had a string around the pins when Henry rolled.

When parched tongues could no longer stand the drought, a march was made to Lenny's Wagonwheel Restaurant and Bar where dinner was served. As well as being entertained by the orchestra and a petite dancer, the boys were also aroused to cheers when regaled by the New Haven Male Quartet composed of Sam Spalding, Ray Porter, Fred Dawless and Don Sawtelle.

After dinner the boys moved back to the Singer Club where the technical session was held. After an introduction by Chairman Percy Clark, our guest of honor treated us to a talk as only the one Bill Eisenman can do.

Following a report on Current Developments in Physical Testing by A. D. Eplett, the meeting was turned over to Technical Chairman L. E. Raymond of the Singer Co., who introduced the speaker, John F. Wyzalek of the Hyatt Bearing Division of General Motors. His talk on carburizing has already been reported in THE REVIEW.

The annual Christmas party followed the talk. Prizes were distributed with such generosity that each member and guest left with a gift.

**Oil-Less Bearings Show
Development of New Field***Reported by J. Q. Adams*

Schenectady Chapter, Dec. 17—The Chapter on this date had the opportunity to peep into new fields of metallurgy through an excellent talk, accompanied by slides, on "Compo Bearings" given by Dr. D. C. Claus, research engineer, Bound-Brook Oil-Less Bearing Co. Although not all of the 16 new members were present, there was a very good turnout.

The application of oil to a bearing through a porous structure was shown to have many advantages and practically no disadvantages. Where the bearing is standardized or required in large quantities, costs can be kept low.

Powder metallurgy is developing, for in this product of copper, tin, and graphite almost unlimited uniform porosity is possible; manufacturing tolerance of 0.0005 in., Brinells of 20 to 90, tensile strength of 15,000 psi. with the absence of the usual casting defects can be obtained.

**1936 Metal Congress
Comes to Cleveland**

The 18th National Metal Congress and Exposition will be held in Cleveland, Ohio, the week of Oct. 19 to 23, 1936, it was announced by the American Society for Metals on Jan. 16.

**Long Bars Require Stress
Relief Before Machining***Reported by J. W. McBean*

Ontario Chapter, Nov. 8—In his talk to the Chapter, Jordan Korp of Leeds & Northrup Co. took up heat treating with controlled atmospheres. He also stressed some important points in practical heat treating. In dies and long bars, for instance, he showed how important it is to relieve stresses thoroughly before machining, by normalizing or other process.

Since heat can travel into the body of steel only by conduction, which is a slow process, there is a lag between the inside and outside temperatures of a thick piece of steel if the furnace is much hotter than the metal. The rough rule of 1 hr. heating for each inch in diameter was shown to be quite inadequate for heavy pieces. When sharp corners are present it is important to keep the temperature lag small to avoid serious strains.

The critical point of a particular steel may vary considerably according to the previous mechanical or heat treatment. The interval above the critical must vary according to the use of the piece. For instance, for cutting tools the interval should be small, but for coining or other dies subject to great pressure it must be large to secure sufficient depth of hardness.

Mr. Korp gave some information on scaling, decarburization and pitting. Water vapor may be absorbed by carburizing mixtures and cause trouble by decarburization or soft spots. It is therefore important to limit the amount of water vapor in controlled atmospheres.

The interest in the talk was demonstrated by an attendance of well over 100, and by the barrage of questions which lasted the better part of an hour.

**Trustees Approve New Appointments,
Make Plans for Next Metal Congress**

The first order of business at the meeting of the Board of Trustees of the American Society for Metals, held Nov. 1, 1935, at the National Office in Cleveland, was the approval of committee appointments.

C. H. Herty, Jr., was appointed chairman of the Metals Handbook Committee for a term of one year. G. C. Riegel and W. C. Chancellor were appointed to the Committee for two years, and R. L. Dowdell and S. L. Hoyt for three years.

W. P. Sykes was made chairman of the Publication Committee. Louis Jordan and G. V. Luerssen were appointed to serve on that committee for one year, M. A. Grossmann and H. I. Ardahl for two years, and Norman Stotz, A. A. Bates, O. W. McMullan, and C. N. Dawe for three years each.

Zay Jeffries and W. S. Bidle were unanimously reappointed to the Finance Committee for a period of three years. Sam Spalding was designated as the representative of the Board of Trustees on the Constitution and By-Laws Committee, and L. D. Hawkridge was appointed for a three-year period.

The minutes of the Finance Committee meeting held the previous day

**Round-Table Discussions Are
Popular With A.S.M. Chapters**

Round-table discussion and conference meetings are comparatively new A.S.M. chapter activities which are receiving wide acclaim among those groups conducting them this year.

In a report of the discussion groups being sponsored by the Cincinnati Chapter, Carl Graves, chairman of the Educational Committee, states: "Interest in the Chapter has been intensified and membership has been increased. The Society has been brought into more intimate contact with the problems of its members, and is becoming even more firmly rooted in the industrial life of our community."

Several groups have been organized in Cincinnati, the first of which, on "Furnace Design," is now completed. It consisted of five meetings attended by about 20 men, the last meeting being the largest and most enthusiastic of all. Two more groups on "Sheet Metal" and "Small Tools and Their Heat Treatment" are now under way.

The organization of the work of each group is left to the group leader with the assistance of one member of the Educational Committee. The meetings start with a short talk by a man well versed in that phase of the subject assigned for the evening. According to Mr. Graves, notebooks are often in evidence and a lively discussion follows.

From E. J. Tompkins of the Chicago Chapter Publicity Committee comes a report of the newly inaugurated meetings known as "Advanced Metallurgical Seminars." These seminars were organized at the suggestion of Dr. M. A. Grossmann for informal discussions of highly theoretical topics. Their purpose is to render service to the techni-

cally trained metallurgists who represent about 20% of the Chapter membership.

The first seminar was held Dec. 3 on the subject of grain size. Brief talks were given by Messrs. Grossmann, Archer and Epstein, which served to crystallize the discussion about various controversial points. The 70-odd present entered freely into a discussion so active and extended that it had to be terminated after more than two hours.

Samuel Epstein, in commenting recently on this meeting, said: "Maybe one shouldn't confess getting excited about shop talk, but the redistilled essence of shop talk at the Seminar was highly exhilarating to me. And I learned a truly surprising amount which would have been hard to get in any other way. By all of us putting our heads together quite a few sparks were struck."

Further meetings are contemplated at about monthly intervals; the proposed subject for the January seminar is machinability.

Discussions Replace Coffee Talks

The Detroit Chapter is holding discussion groups at regular meetings in lieu of coffee talks or other entertainment. They are held after the dinner for a period of 30 min. before the address of the main speaker.

A subcommittee of the Papers and Meetings Committee has charge of selecting the discussion leaders and topics. Dinner is served at ten or twelve small tables seating 15 each. A placard at each table shows the topic to be discussed there.

Reports E. B. Drake, secretary of the Chapter: "We select rather varied topics so that the boys will have a choice. Topics may be repeated at subsequent meetings if the interest in them warrants. We have had no trouble getting discussion leaders and we rather insist that they be men from the industries. Some of the tables have been a little more popular than others and sometimes men want to be at several tables at once. But this creates a lot of interest and enthusiasm."

A series of experimental "round-table discussions" are also in progress in Cleveland. A prime object is to find a more interesting type of meeting than the standardized lecture type.

One discussion on machinability has already been held, under chairmanship (Continued on page 3, column 1)

**Discussion Period Centers
On Effects of Grain Size***Reported by Walter M. Saunders, Jr.*

Rhode Island Chapter, Dec. 6—In spite of the cold weather in Providence, a small but enthusiastic audience gathered at the Providence Engineering Society to hear D. A. Nemser, representative of International Nickel Co. Research & Development Department, talk on "Nickel and Alloy Steels."

Following Mr. Nemser's excellent presentation of the applications of these steels, discussion centered on effects of McQuaid-Ehn grain size on properties of steels, both plain and alloy.

Interest was also evident in the effect of small amounts of nickel in plain carbon tool steels. Contrary to the common custom of specifying a low limit for nickel in such steels, Mr. Nemser stated there was no justification for regarding amounts up to about 0.3% as detrimental. Although as a metallurgist for a large manufacturer he used to include a low limit for nickel in his specifications, he believes that reasonably higher amounts have little effect.

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Gleanings From the Chapters

The most significant chapter activity reported to the National Office this month seems to be the growing interest in special discussion meetings and groups. Reports showing how some of the chapters are conducting them take the biggest headlines on our front page. . . .

It's just another indication of that A.S.M. progressiveness which is rapidly bringing the Society up to gargantuan proportions. . . . In November alone New Jersey knocked down 89 new members and Pittsburgh 54. . . . Philadelphia, Schenectady, and Cincinnati weren't very far behind in December. . . . St. Louis is within three of its all-time high in membership. . . .

A really appreciative member is Earl Penrod, who regularly travels 65 miles to attend Pittsburgh Chapter meetings. He is engineer of tests at the Bethlehem plant in Johnstown and has 300 men under him. . . .

We think Frank McDonald of Ritter Dental Co. holds another record. He has attended 145 of the 150 meetings of the Rochester Chapter and 14 of the 17 conventions of the Society. . . .

Incidentally, Rochester Chapter had the largest turn-out in three years to hear Jimmy "Tool Steel" Gill on Dec. 9. . . .

The Pittsburgh Chapter and President Archer crashed the Pittsburgh Sun-Telegraph to the tune of a lengthy column and a quantity of black-faced type after the November meeting (report on page 5, column 4). . . .

Si Edwards, past chairman of Golden Gate Chapter, didn't fool when he drove to the convention last fall. Crossing the desert, he saw a sign, "92 Miles to the Next Town," and he was there in 92 minutes. The whole story's pretty hard for us cooped-up easterners to believe, but anyway we're glad Si had a new car in good condition. . . .

The New Haven Male Quartet is composed of Sam Spalding, Ray Porter, Fred Dawless, and Don Sawtelle. A rumor has it that Guest of Honor Bill Eisenman was moved to tears by the renderings at the December meeting. . . .

Well, New Haven may go musical, but Philadelphia Chapter's Secretary Adolph Schaefer can't be beat in the literary line. We wish we had space to reprint here his December News-Letter containing the parody on "The Night Before Christmas" that tells how Santa Claus Keller visited the Philadelphia boys. . . .

A. D. Beeken, Jr., efficient chairman of the Society's Tool Steel Committee, had 14 members of that committee present at the meeting in Pittsburgh on Dec. 15. . . .

Good times are here again, according to Chairman Oliver of Dayton. Dinner meetings have been revived with the Chapter sharing part of the expense. . . .

Feb. 22 is to be the big date in Buffalo. It seems the Chapter is planning a gala supper dance at the Hotel Buffalo, with food, entertainment, and an eight-piece orchestra. Attendance is limited to 100 couples, or we'd be tempted to run up there ourselves.

More records: Alexis Caswell is in his 17th year as secretary-treasurer of the Northwest Chapter, Irving Matthews has served the Rochester Chapter in the same capacity for 10 years, and Hi Walker has kept the records in Pittsburgh for 14 years.

Alloy Cast Iron Is Los Angeles Topic

Reported by Louie W. Mosley

Los Angeles Chapter, Oct. 24—In keeping with the Chapter's policy of featuring interesting talks by prominent speakers from different sections of the country, E. K. Smith of the Electro Metallurgical Corp. of Chicago read a paper on "Alloyed Castings."

Mr. Smith dealt with a number of the alloying elements used in ferrous castings, explaining the definite purpose and effect of each, particularly some of the newer and less widely known applications. He cited the use of columbium and titanium as a deterrent to intergranular corrosion, and mentioned the effect of nitrogen in the Hadfield steels and the high chromium-nickel steels, such as 18-8.

He classified the elements as carbide formers and their direct opposites, the graphitizers, and outlined their relation to the phenomenon of growth in cast iron. He mentioned zirconium as a graphitizer, or softener. He advanced the theory that growth in cast iron is most nearly eliminated by the formation of a stable carbide, which is effectively done with the addition of about 1.25% of chromium.

Several different types of castings were described as being suited to certain definite uses. Among them were the low carbon (1.35 to 1.50%), high chromium (24%) cast irons for hardness and corrosion resistance; the low copper-chromium alloys for good machinability and high Brinell; and the molybdenum and vanadium alloys for high tensile strength. He commented on the increased use of alloys in malleable castings, and the recent findings on the usefulness of copper as an alloy.

Reports on visits to the recent 17th National Metal Congress were given by two local members. W. F. Farrar spoke of the advertising value of the exhibits and the results obtained and enumerated those that most impressed him. B. Reinhold read a most interesting report, spiced with wit as well as a number of carefully detailed technical observations.

The invitation to present practical metallurgical and heat treating questions from the floor for the consideration of the Consulting Board was met with a broadside of problems which will keep the Board busy for at least a month.

No More \$5 Memberships

A membership in the American Society for Metals will henceforth be accepted only on the payment of \$10 for one year's dues in full, it has been announced in the National Office.

During the past few years memberships were accepted on the payment of \$5 for a half-year's dues, but with the present bright business outlook the need for this seems to have passed. Chapter officials are therefore requested to accept no more \$5 memberships.

Gill's Tool Steel Course Completed in New Haven

On Dec. 9, Dr. R. M. Brick of the Department of Metallurgy, Yale University, completed the fourth of a series of four weekly lectures on tool steel presented to the New Haven Chapter. About 90 members registered for the course, the average attendance being about 75.

The course was based on J. P. Gill's series of lectures on this subject given at the New York National Metal Congress in 1934. Dr. Brick, however, added some information on molybdenum high speed steel and the effect of controlled atmospheres on tool steels.

In the words of one of the members of the Chapter: "There was not a metallurgist or heat treater who attended these meetings, regardless of the height he has reached in the metallurgical field, who did not receive a new thought in each of these meetings. The discussions were conducted by a different member of the Chapter each evening and drew forth much matter of great interest."

ODDS & ENDS

New or Raw???

You may think this is the Age of Metal. But before this election year is over you'll have to decide whether it's the Age of the New Deal or the Raw.

A Long Time, But—

Nine out of ten steel executives start at the bottom of the well-worn ladder and work their way up, the American Iron and Steel Institute tells us. The majority begin as laborers in the mills. The 176 executives interviewed by the Institute had an aggregate experience of 5664 years. We doubt whether this would be enough to equip us for the job.

Your Own Brain Trust

Did you ever stop to think, as you go over the helpful literature, listed in THE REVIEW and in *Metal Progress*, that the best brains in the metal industries are placed at your disposal in these folders. The information in one of these booklets may solve your current problem. Help yourself! You place yourself under no obligation when you return the coupon for helpful literature.

Aluminum Parabola

New uses for aluminum seem to be continually popping up. Now it seems that a California professor has developed a method for coating parabolic mirrors with aluminum by controlled deposition.

This eliminates the tedious and costly grinding required on silvered mirrors—quite a saving when it is remembered that five years and tens of thousands of dollars are still to be spent in this way on the California Institute of Technology's new 200-in. disk!

Earful

The interesting gadget of the month is described in Steel's "Toncan Topics." It seems there's a new eavesdropping device which can be installed in storefront windows. A recording apparatus reproduces conversation in front of the window and gives the adman a firsthand account of how his work impresses the public. No thanks, I'd rather not have one to tune in comments on this column.

Covers De Luxe

The December and January covers of *Metal Progress* must have brought joy to your heart. There have been many compliments on these striking illustrations. "The River Mill" by Roy Hilton (used on the January cover) seems to be the most popular. But wait! Look for the February cover—we'll tell you now that it will feature stainless steel and knock your eye out.

Lighting a Stack

We read recently of the job of putting U. S. Steel's two blast furnaces in the Cleveland Cuyahoga Valley into operation again. It made us feel tired just to read about it. It seems that these plants were dismantled a few years ago when the economic toboggan slide got under way. It was a six months' job then, and now they are trying to get under way in six weeks! Just another reason why 5664 years seem like a short time to learn the steel business.

Stainless in Italy

The steelman's job is certainly varied. He not only has to know when to light a stack, but must also know financing and sales opportunities. Now who would look twice at the fact that women in Italy are donating their wedding rings to Mussolini? The steelman did and saw an opportunity to sell them rings of stainless steel!

Don't Miss It

The February issue of *Metal Progress* will be the biggest in several years, excepting of course the Metal Exposition numbers. There will be more articles and more variety than you've seen in many a moon. Incidentally, this issue will carry more advertising than any issue for four years, excepting again the special numbers.

Happy New Year, and remember—this is leap year!

HERE AND THERE WITH A.S.M. MEMBERS

The most meritorious achievement in the field of metallurgy in the year 1934 was judged by the Technical Society of Philadelphia to be Dr. C. H. HERTY's comprehensive volume on the physical chemistry of steel making. On Dec. 7 he was therefore made the first recipient of the Francis J. Clamer Medal, an award made at the bequest of the late Francis J. Clamer, founder of the Ajax Metal Co.

Dr. Herty's weighty tome represents the result of an eight-year research at the Bureau of Mines in Pittsburgh, completed in 1934. Since then he has been research engineer for the Bethlehem Steel Co.

For three years sales manager and chief metallurgist for Youngstown Sheet & Tube Co. in Chicago (where he attends A.S.M. chapter meetings) WILLIAM J. MACKENZIE is now head of the alloy steel division. He was formerly vice-president of the Interstate Iron & Steel Co., now a part of Republic.

Union Carbide's "GUS" KINZEL got the wanderlust again and has gone to Russia to address the Society for Science and Culture of the U.S.S.R. at Moscow. He will speak on engineering and stainless alloy steels, and expects to be back in the States about the middle of February.

STANLEY A. RICHARDSON, member of the Canton-Massillon Chapter, has been appointed general sales engineer of Empire Sheet & Tin Plate Co. His former position of chief metallurgist has been taken by WILLIAM FOX, Cleveland member, who has been chief chemist of Empire for 15 years.

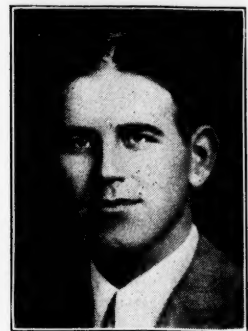
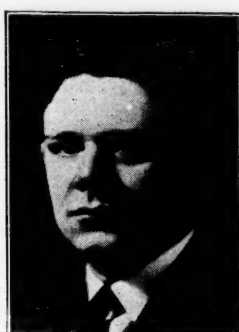
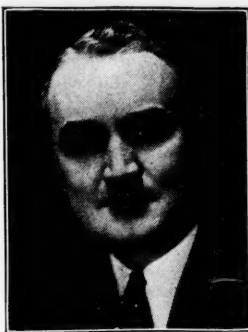
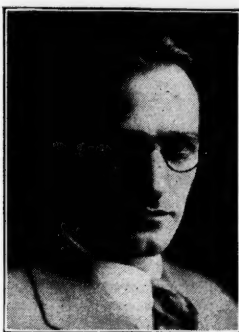
Richardson was educated at University of Minnesota and University of Chicago, and was for some years chief metallurgist of Interstate Iron & Steel Co. when it merged with Republic.

Before coming to Lee Wilson Engineering Co., Cleveland, C. H. CARPENTER spent 18 years with Westinghouse Electric & Mfg. Co., 13 of them devoted to the development of electric heat treating furnaces. He is a graduate of Colorado School of Mines.

Past-President BILL COLEMAN (World's Greatest Photographer) Leica'd 4000 pictures during a recent two-month trip through the West.

L. S. COPE, for 14 years plant and research metallurgist of the National Screw & Mfg. Co., has been promoted to general superintendent of the entire company.

He came to Cleveland from Ann Arbor where he was metallurgist for the Hoover Steel Ball Co. He has been an active member since the early beginnings of the A.S.M.



Top Row: C. H. Herty, Jr., William J. Mackenzie, A. B. Kinzel.

Bottom row: Everett L. Reed and Thomas N. Armstrong.

Back to the Boston Chapter goes EVERETT L. REED, formerly research metallurgist with the American Sheet and Tin Plate Co., Pittsburgh; now research metallurgist in the Ordnance Department, Watertown Arsenal, Watertown, Mass.

Dr. Reed was for many years instructor in metallurgy and metallography at Harvard Engineering School, where he received his doctor's degree in 1930.

Transferred from the Cleveland offices to the Philadelphia factory of Leeds and Northrup Co., P. C. BADGLEY has also transferred his membership from the Cleveland to the New Jersey Chapter.

FRANK GARRATT, technical director, Universal Steel Co., has been on an extended health trip through Denver, California, and the Panama Canal.

ALEXANDER FIELD has resigned from Carnegie Institute of Technology due to ill health.

HENRY H. ZIESING, general sales manager, The Midvale Co. (representative of sustaining membership Philadelphia Chapter) was elected a new director of the Steel Club of Philadelphia.

THOMAS N. ARMSTRONG, Washington Chapter, who recently joined the Development and Research staff of International Nickel Co., was for seven years yard metallurgist at Norfolk Navy Yard. He is a graduate of University of Kentucky and spent two years on the open-hearth of Andrews Steel Co.

Many prominent A.S.M. members are among the guest speakers who will address students of metallurgy at Carnegie Institute of Technology this year. Among them are E. H. DIX and R. L. TEMPLIN of Aluminum Research Laboratories; J. P. GILL, Vanadium-Alloys Steel Co.; R. R. LAPELLE, HOWARD SCOTT, and T. D. YENSEN of Westinghouse Research Laboratories; W. H. PHILLIPS, Molybdenum Corp. of America; RICHARD RIMBACH, Metals & Alloys; and JEROME STRAUSS, Vanadium Corp. of America.

Secretary J. H. JOHNSON of the New Jersey Chapter landed in Muhlenberg Hospital, Plainfield, N. J., with two broken ribs and three broken vertebrae after an automobile accident on Dec. 15. In spite of considerable pain, he has high hopes of getting on his feet again before too long.

LOUIS JORDAN, senior metallurgist, chief of the Section of Thermal Metallurgy, and assistant chief of the Division of Metallurgy of the National Bureau of Standards (Washington Chapter), apparently broke down under the weight of so many titles and is resigning in order to serve as secretary of the Iron and Steel Institute of Metals Divisions of the A.I.M.E. This is a newly created position designed to benefit the activities and publications of both divisions.

No kin to Louis is HARVEY B. JORDAN, appointed Cleveland district manager of the American Steel & Wire Co. He has been with the company for 18 years and represents its sustaining membership in the Cleveland Chapter.

From 1927 to 1933 he was superintendent of blast furnaces and docks and in 1934 became director of manufacturing practices and production standards. He is a graduate of Pennsylvania State College, and worked for Jones & Laughlin and Joseph E. Thropp Co. before coming to A.S.&W.

A.S.M. Past-President FRANK P. GILLIGAN is chairman of the newly formed Southern New England Section of the Society of Automotive Engineers.

Two of the speakers at the meeting devoted to "Steel Alloys, Present and Future," held during the recent Metal Products Exhibits in New York, were members of the A.S.M.—HARRY W. McQUAID, metallurgist, Republic Steel Corp., and Dr. JOHN JOHNSTON, director of research, United States Steel Corp.

DICK RIMBACH, member A.S.M. since the year 1, is, in addition to his numerous editorial duties, supervisor of the metallurgical department of the night school at Carnegie Tech and teaches technical German to the graduate students.

The Robert W. Hunt award, given by the A.I.M.E. for the best technical paper of the year on the manufacture of iron and steel, has been conferred upon C. C. HENNING, assistant general metallurgist of Jones & Laughlin Steel Corp., for his paper on "Manufacture and Properties of Bessemer Steel" presented at the Institute's annual meeting last February.

Mr. Henning has been with the company since 1915. He is a member of the A.S.M. and A.S.T.M.

GEORGE L. NORRIS, past-chairman New York Chapter, is gradually taking up his duties at the Vanadium Corp. again after a siege in the hospital.

Deaths

ZEPHANIAH L. SAULT, charter member of the Boston Chapter and chairman in 1922-23, died of a cerebral hemorrhage last November. He was manager and vice-president of the Porter Forge & Furnace Co., Inc., of Everett, Mass.

One of the first members of the old "Steel Treaters" before the name was changed to American Society for Metals was W. C. PETERSON, who died Dec. 21.

His first job as a metallurgist after graduation from college was with Packard Motor Car Co. After several years there, he went into the steel business and worked for Halcomb, Atlas, and Donner Steel Companies. At the time of his illness last August, he was connected with the Commonwealth Heat Treating Co.

SCOTT LYNN, president of Sangamo Co., Ltd., Toronto, member Ontario Chapter, died January first.

RADCLIFFE FURNESS, onetime member of the Philadelphia Chapter, well-known at A.S.M. technical sessions and as contributor to the National Metals Handbook, died Jan. 12 at the age of 67. He was superintendent of the open-hearth and forge departments of the Midvale Co., Philadelphia.

Discussion Groups Popular

(Continued from page 1)

of E. E. Thum, editor of *Metal Progress*. Among the 100 or more present were eight or ten men expert in this or that phase of the subject, and each talked informally as the colloquy developed. The result was a well-rounded picture of how to improve the machinability of metal (as may be judged from a brief report of the proceedings in the last issue of *Metal Progress*), and the meeting did not put any great burden of preparation on any of the participants.

In the above respects the meeting was a success, but its chairman ventures the opinion that it failed to be the real "round-table discussion" hoped for. Whether the surroundings were wrong (a lecture room at Case School of Applied Science), whether the attendance was too large, whether the speakers were too illustrious is not yet known, but the fact remains, according to Mr. Thum, that "as usual the tongue-tied, blushing violets reserved their questions until after the meeting was adjourned."

After two not very successful attempts last year to organize discussion groups, the Hartford Chapter hit upon

the idea of using Executive Committee meetings as a nucleus.

This has stimulated attendance of officers and Executive Committee, but the meetings so far have averaged only five additional members. However, they are large enough to be worthwhile, yet small enough to be intimate so that everyone enters into the discussion.

Their purpose is to solve current problems of the members and discuss technical articles of interest.

X-Ray Development Traced

Reported by J. S. Seville

Lehigh Valley Chapter, Nov. 15—Fifty-eight members and guests were present at the meeting to hear Dr. G. L. Clark, eminent authority on X-Rays, speak on "X-Rays and Metals in 1935."

Dr. Clark briefly outlined the development of X-Ray technic since discovery of the rays in 1895 and then described in greater detail the present application of X-Rays to several specific problems. Dr. Clark's address was capably presented and well received.

An informal question period was held after the lecture.

Minor Items May Lead To Heat Treat Difficulties

Reported by George A. Ellinger

Washington Chapter, Nov. 18—Seventy-four members of the chapter were present at the second meeting of the year and heard Dr. Norman E. Woldman, senior materials engineer, United States Naval Gun Factory, discuss "Commercial Heat Treating—Troubles and Difficulties."

Dr. Woldman outlined the troubles besetting the commercial heat treater and stressed the necessity for close cooperation among design engineers, metallurgists, and heat treaters. Many apparently insignificant things are often overlooked by one or the other and may lead to serious difficulties in heat treating.

Distortion of stock and inadequate support of material in the furnace, insufficient stock to take care of warpage, non-uniform grain size, and different sizes and types of material in the same furnace lead to much rejection of material. Quenching cracks, heat treatment of tool steels and methods for local hardening were also discussed by the speaker.

Inter-Chapter Meeting Slated for May 1 and 2

The Second Pennsylvania Inter-Chapter Meeting of the A.S.M. will be held at Pennsylvania State College, May 1 and 2, 1936.

The chapters participating will be Philadelphia, Pittsburgh, Lehigh Valley, York, Southern Tier, and Penn State; each will sponsor one speaker on the two-day program. The meeting will be conducted along much the same lines as the very successful first meeting, held two years ago at State College.

The Proceedings of this first meeting have been published as Pennsylvania State College, Mineral Industries Experiment Station Bulletin No. 18 and copies may be obtained by addressing the School of Mineral Industries, State College, Pa. The price of this bulletin is 50c, and it contains the following papers:

Research in the Steel Industry, by Dr. John Johnson.

The Habits and Laws of Decomposition of Super-Cooled Solutions With Special Regard to Austenite, by G. B. Upton.

Steels: Their Selection and Application in General Shop Practice, by Frank J. Allen.

Wrought Aluminum Alloys for Structural Applications, by E. H. Dix, Jr.

The P-F Characteristics of Steel, by B. F. Shepherd.

The Effect of Gases on Ferrous Materials at High Temperatures and Pressures (Abstract only), by H. L. Maxwell.

Harper Traces History of Forgings, Catalogs Defects

Reported by E. F. Bicknell

Tri-City Chapter, Nov. 12—J. Fletcher Harper, research engineer for the Allis-Chalmers Co. of West Allis, Wis., was the principal speaker of the evening. He traced the history of the forging of steel from a period several centuries before Christ up to the present day. His talk was illustrated with stereopticon slides showing modern forging presses ranging in capacity up to 3000 tons.

Mr. Harper catalogued defects in forgings in two classes—those in the metal and those brought about by improper mechanical forging operations. He explained how the Allis-Chalmers Co. uses the periscope method for the inspection of all forgings larger than 9 in. in diameter.

Coach Harold V. Almquist of Augustana College told of the trials and joys of being a coach. He said that the grades of the average athlete are as high as, or higher than those of the fellow student who does not participate in athletics. Good athletes, he declared, are good students.

Many Items Covered in Talk on Tools and Gages

Reported by Elton W. Jenkins

New Jersey Chapter, Nov. 4—Approximately 100 members attended the dinner and there was a well-packed house for the lecture. Speaker of the evening was A. H. d'Arcambal of Pratt & Whitney Co., Hartford, Conn., a past president of the A. S. M.

His subject, "Recent Developments in Metal Cutting Tool and Gage Fields," covered the following items:

Development of high speed steels, including the tungsten-vanadium steels of the 18-4-1 and 18-4-2 types; also molybdenum-vanadium high speed steels.

Nitriding of high speed steels.

Development of cemented carbides.

Chromium plating as used in the manufacture of cutting tools and gages.

Development in design of cutting tools.

Development of gages, including the Electro-Limit gage and the latest methods of heat treating carbon and high speed tool steels.

These subjects were very ably handled and the discussion which followed gave evidence of the general opinion expressed by all that the lecture was one of the best they have yet attended.

Lead Finds Many Uses in Various Types of Alloys

Reported by Gordon Sproule

Montreal Chapter, Nov. 4—An excellent sound film of the "Century of Progress" Chicago Fair followed the dinner and preceded the lecture, which was entitled "Some Industrial Uses and Characteristics of Lead and Its Alloys" and was given by A. R. Neville, service engineer of the Canada Metal Co., Montreal.

First mentioned were the well-known lead-tin solders, in which increased strength, lowered melting range, and other desirable properties are obtained by rather large additions of tin—33 to 63%.

Tin, however, is expensive, and where increased hardness is the chief object, it is more cheaply attained by the use of antimony. Battery plates, pipe, tank lining, and hard lead castings for acid resistance in chemical industry are important uses of antimonial lead.

In type metal lead is alloyed with both tin and antimony. Several grades were described, ranging from low alloy electrotype metal, used for backing a copper deposit, to monotype and type-caster metals, used for permanent type. The chief requirement of type metal besides hardness is fluidity—low viscosity and low surface tension—and the bad effects of zinc, aluminum and copper, when present as impurities, were described.

Bearing metals are generally called babbitt metal, although Babbitt's original patented alloy contained tin 88.9%, antimony 7.4%, and copper 3.7%. On account of the high cost of genuine babbitt, various "lead-base" and "medium" babbitts have been evolved, very similar to type metal, consisting of lead hardened with antimony and tin, but for severe service tin babbitt is still superior.

The lecturer next told of the modern developments in lead alloys. First the Germans invented alkali lead; an improved composition of this class contains calcium 0.73%, sodium 0.58%, and lithium 0.04%. This alloy and others similar to it are comparable with genuine tin-base babbitt, and have an advantage in a much higher melting point.

Returning to the use of lead in acid resistance, the lecturer told how certain brands of "chemical lead" were found superior to highly refined pure lead. This knowledge stimulated the discovery of controlled (nickel-bearing) chemical lead, and ultimately of Teledium, an alloy of lead and 0.05% tellurium. This alloying element improves corrosion resistance and mechanical properties. Tellurium-lead work-toughens and increases the endurance limit three or four times. These advantages are retained at elevated temperatures and are apparently due to grain refinement.

Slides were shown of microstructures, melting points, physical properties, and various applications.

Archer Advises Common Sense in Applying Theory

Reported by B. R. Queneau

Northwest Chapter, Dec. 10—The National Officers' meeting was a decided success with over 100 present to hear President R. S. Archer of Republic Steel Corp., speak on "Progress in Metallurgy." A short history of steel was given, followed by some very interesting sidelights on the beginning of the A.S.M. and the development of heat treating during the past 15 years. The final bit of advice was that common sense must be used in the application of theory if good results are to be obtained.

Bill Eisenman then gave his usual genial talk, though it was filled with comments on the weather when it was only ten below zero and hadn't even started to get cold here yet. The meeting was started by motion pictures of the National Champion Minnesota football team in action, which was not very hospitable considering that President Bob comes from Michigan.

Detroit Chapter Finishes First Series of Lectures

The first half of the Detroit Chapter's educational program was completed on Dec. 5 when the last of five lectures on "The Story of Steel" was presented in Lansing, Mich., where the course was held for the benefit of those living in the center of the State.

The course was conducted by Prof. Frederick G. Seifing of Michigan State College, and drew an average attendance of 43. Each lecture was accompanied by one or two reels of motion pictures.

Mr. Walter G. Hildorf, chief metallurgist, Timken Steel & Tube Co., was secured to present the final lecture, which concerned the manufacture of automotive steels. Over 100 automotive engineers and metallurgists heard this lecture, which, to quote Professor Seifing, was a revelation to them.

The second lecture course of the Chapter educational activities will start in Detroit on February 17, when Dr. W. T. Sproull of General Motors Research Laboratories will give the first of six lectures on "X-Rays Applied to Metallurgy."

Bearing Metals Brought Up to Date, Many Alloy Types Described

Reported by E. W. Moore

Rochester Chapter, Nov. 11—This was the 150th meeting of the Chapter. The coffee talk by "Rip" Benzoni concerning the timely subject of football was thoroughly enjoyed by all.

National Secretary Bill Eisenman was present and talked on the Convention and affairs of the National Office. It was a pleasure for his old friends to greet him, and new ones to meet him.

C. H. Bierbaum, vice-president of Lumen Bearing Co., was the main speaker; his subject was "Bearing Metals Brought up to Date." He pointed out that the only way to test a bearing is in service—destructive methods of test have little value. His exposition included aluminum bronze alloys; tin-copper; copper-zinc; tin, copper, and antimony; tin and lead; and nickel-phosphorus bronze.

Lantern slides of high magnification proved that scraping usually ruins a bearing and that a single-blade reamer will do an excellent finishing job. A multiple blade reamer exerts too much pressure and usually ruins the bearing. Diamond boring leaves an almost complete bearing of hard, projected crystals, set in a matrix of soft material, sunken slightly below the surface of the hard crystals. Such a bearing does not require a running-in.

Lantern slides also demonstrated the effects of lubricating oils. Mr. Bierbaum showed that a proper film of oil allows no metal-to-metal contact and consequently very little wear. Sulphur in lubricating oils completely destroys some bearing metals.

Nitrided surfaces were highly recommended and the speaker pointed out the fallacy of some present day heat treating methods.

In his opinion the steel in Johannsen blocks is one of the hardest and most homogeneous he has ever encountered and is free from graphite spots near the surface.

L. Marshall led a discussion concerning graphite spots formed near the surface of American steels after hardening. Mr. Lux questioned the speaker regarding his so-called old-fashioned way of case hardening, and it was brought out that more time should be taken and the line between case and core should not be a sharp one. Mr. Desmond asked about cadmium in bearings, and it was shown that cadmium washed away in a few hours under certain conditions.

Transactions Index

Copies of the index to Volume 23 of *Transactions*, January to December, 1935, may be had gratis on request to A. S. M. headquarters, 7016 Euclid Ave., Cleveland, Ohio.

Cast Irons for Automotive Use Are Specialized

Reported by Kurt Siems

Cincinnati, Dayton, and Columbus Chapters, November Meetings—Many interesting facts not generally known were told in the address on "Automotive and High Test Cast Iron" delivered by E. K. Smith of Electro Metallurgical Corp., Chicago, to the Tri-Chapters on consecutive nights.

Tremendous strides in cast iron development have been made in the past five years, and whereas formerly the same iron was used, for instance, on cylinder blocks, pistons, and other parts of an automobile motor, today each one of these parts is made of an iron especially adapted to assure best results.

A modern motor cylinder block of cast iron contains copper from ½ to 1½%, molybdenum not over 1%, and chromium ½%, the actual proportions varying according to the manufacturer. They generally Brinell between 192 and 421.

The use of the chill test could not be too strongly recommended by the speaker, and he brought out that depth of chill is the same regardless of whether the metal is red hot or is taken out of the mold immediately after pouring and quenched.

The wear test used by one manufacturer on an automobile cylinder with a Brinell hardness of 192 to 212 to prevent valve pound was explained. The conclusions derived therefrom were that it is bad to anneal cast iron; and that fine graphite flakes or phosphorus (up to 1%) or chromium (0.20% or more) are aids to wear resistance.

Again for cylinder liners and brake drums, various manufacturers use differently proportioned alloys. General Motors, for instance, has standardized on a mixture which contains 2% nickel and 25% chromium. These liners are oil quenched and reach a Brinell hardness of 550. Another manufacturer nitrides his cast iron cylinder liners. This is a comparatively new development used more in England than in the United States.

An alloy for super brake drums consists of titanium, copper, and chromium.

In the discussion at Cincinnati, the speaker illustrated graphically on the blackboard the chill test method.

Reported by F. B. Fuller

A variety of questions were asked during the discussion period at Dayton. Neonite was mentioned but has only slight application in the automotive field.

Phosphorus, since it lowers the impact qualities, is limited to a maximum of 0.25% in automobile blocks. Silicon, which produces brittleness, is limited to 1.5 to 2.00% in a 24% chromium iron.

The addition of a small amount of titanium in some irons, and in others the reduction of the size of the graphite flakes, eliminated pinhole pitting in vitreous finishes.

Soft iron should be aged at 700° F. and alloy iron at 900° F.

Good Food, Music, Floor Show, Beer, Make Fine Xmas Party

Reported by Ralph Leiter

Philadelphia Chapter, Dec. 6—Good fellowship, good cheer and complete absence of technical and business affairs formed the keynote of the Chapter's annual pre-holiday party.

Nearly 200 members gathered in the Banquet Room of Kugler's Restaurant. We were happy to have Bill Eisenman with us at the dinner and sorry to see him leave for New York while the evening was yet young.

Charlie Stoeckle and his entertainment committee are to be congratulated for arranging a "bang-up" evening. The dinner was excellent—good food and plenty of it, fine music by a five-piece orchestra, plenty of cigarettes, and quantities of beer.

The floor show which followed was chuck-full of wit, humor, good dancing and pretty girls. It was thoroughly enjoyed by all.

Annual Cost of Corrosion In U.S. Is \$964,000,000

Reported by Louie W. Mosley

Los Angeles Chapter, Nov. 18—The Chapter drew a full attendance to hear Dr. F. N. Speller, who had come to the Coast to present a paper before the American Petroleum Institute and was induced by Chairman C. E. Burt to address the Chapter on "Corrosion of Ferrous Metals."

The annual cost of corrosion in the United States alone was estimated by Dr. Speller to be \$964,000,000. He figures that production and replacement of steel did not offset the loss due to corrosion during the last two years.

Dr. Speller cited electrochemical reactions as responsible for most corrosion. He mentioned the contact effects of corrosion, and the uneven distribution and scattered concentration of oxygen on the surface of metals, which causes pitting. In fact, any deposit will localize corrosion.

The more durable films which offer resistance to corrosion are the ones invisible to the naked eye, such as those that form on stainless steel. However, even sand and silt will act as a protective coating in water pipes and mains. Cement-lined water pipes are particularly suited for long life.

All gases, even oxygen, are harmless as corrosive agents in the absence of water, and metals undergo very little corrosion in dry, clear air which is free from dust and dirt. Corrosion of stressed parts may reduce their life 70% or more.

Of the three methods of combating corrosion, the most recent and popular is to produce steels, such as stainless, that form their own protective coatings. Another method is to change the en-

vironment to increase the life of natural coatings. The third method is to coat the metal artificially, as with paint.

Confining most of his discussion to the first method, Dr. Speller mentioned several alloys suited to severe corrosion. Copper-bearing steels, "Cor-Ten" steel, and the 5% chromium alloy with titanium and molybdenum were discussed.

Among the interesting points developed in the discussion was the use of titanium to release the chromium from carbides, making possible greater corrosion resistance with a smaller amount of chromium. Titanium in the proportion of four times the carbon will release all of the chromium. It was also brought out that free oxygen has no corrosive effect on steels containing 13% or more chromium.

Cooperation is Important In Sheet Fabrication

Reported by G. W. Quick

Washington Chapter, Dec. 16—The third meeting of the season, held in the Garden Room of the Dodge Hotel, was addressed by Joseph Winlock, research metallurgist, Edward G. Budd Mfg. Co.

In covering the subject of "Drawing, Stamping and Forming of Sheet Steels," Mr. Winlock emphasized the importance of cooperation between millmen, shopmen and metallurgists. He discussed hot and cold rolling, and touched on such related subjects as spontaneous annealing, finishing temperature, grain size, grain growth, recrystallization at temperatures below the critical ranges, and stretcher strains (Luder's lines). The development of stretcher strains is a bugaboo to the manufacturer and particular care is necessary to avoid trouble from them. If they are permitted to form, they must be removed by grinding because they cannot be made invisible by painting.

Motion pictures were shown of the manufacturing operations of stamping, forming and flashwelding automobile bodies and of the effect of driving a car with an all-steel body over a cliff.

Test Specimens May Not Indicate Service Results

Reported by Gordon T. Williams

Cleveland Chapter, Dec. 2—J. R. Townsend, of Bell Telephone Laboratories, was technical speaker at the December meeting, held at the Cleveland Club. Mr. Townsend drew on his wide experience for a talk on "Fatigue and Its Relation to Mechanical and Metallurgical Properties of Metals."

By discussion and illustration he showed how typical failures of telephone equipment have occurred and how they were overcome. Especially pertinent was his explanation of the development of testing methods and technique to simulate service conditions. Mr. Townsend convincingly showed that physical test specimens are not too reliable an index of what may occur in a complex assembly of various sections. Lively discussion was led by Prof. H. D. Churchill, who served as technical chairman.

National President Bob Archer was welcomed after the technical meeting, and presented a few pertinent remarks on the subject of Mr. Townsend's talk. President Wickenden of Case School of Applied Science was also introduced

Non-Ferrous Talk Covers Cu Alloys

Reported by J. W. McBean

Ontario Chapter, Dec. 6—According to the usual custom of having one non-ferrous meeting a year, a talk on copper and its alloys was presented by John R. Freeman, Jr. of the American Brass Co., Waterbury.

Mr. Freeman had a moving picture of the mining and refining of the copper ores and the various manufacturing stages. It was interesting to note the complete change from crucible to induction melting furnaces, which permit larger heats and consequently more uniform compositions.

One of the newer developments is the production of pure electro-sheet made by a continuous plating process. The sheets may be as wide as 63 in., and only a fraction of one thousandth of an inch thick. Applications are varied and include damp-proofing of walls, roofs and cellar floors.

The alloy containing 2% silicon and 1% manganese and known as Everdur has a high strength (about 60,000 psi.), welds easily, is corrosion resistant and moderate in cost.

Another of the newest and perhaps most interesting of the copper alloys is that with about 2% beryllium. The addition of 4% nickel refines the grain of this material.

Maximum physical properties are obtained by first cold working and then heat treating to about 1500° F., to get a solid solution of the constituents, and quenching in cold water. This anneal is followed by heating to 525° F. for several hours which gives a precipitation hardness as high as 360 Brinell, and a tensile strength of 200,000 psi. In spite of the high hardness, it does not produce sparks when subjected to heavy blows, and is especially useful for hammers and other shock tools where sparks would be dangerous.

It has good electrical conductivity. Non-magnetic properties, wear resistance, corrosion resistance, stiffness and good machinability. Beryllium-copper is therefore a very useful material for electrical switches, welding electrodes, springs and other electrical equipment.

It has the advantage of being quite ductile when annealed and therefore can readily be formed and the necessary strength and stiffness conferred later by heat treatment.

and thanked for Case's fine cooperation with the Chapter.

Coffee talker was "WHK" Carpenter, one of Cleveland's outstanding radio business men, and manager of WHK. In a lively talk punctuated by anecdotes, he told a lot about radio broadcasting. The splendid speech amplifier he used was of considerable interest, and the Chapter is now planning to purchase such a unit.

Metallurgists Must Mend Their Ways

Reported by G. R. Fitterer

Pittsburgh Chapter, Nov. 14—This is probably true in more ways than one, but the Pittsburgh metallurgists and the National officers learned of only one at the November meeting.

Mr. L. S. Hamaker of the Berger Manufacturing Co. spoke from a vast resource of experience when he stated that metallurgists lack the ability to translate their technical data into simple terms. A great need is recognized at present for men who can wisely link the technical men with the sales departments and the speaker was convinced that these interpreters should originate from the laboratories. It would then remain the duty of the sales and advertising departments to translate these ideas to the buying public.

It is well known that the technical man does not hold the position he should in this country and according to the speaker it is largely his own fault. He should force his way into the field. Many of those present at the meeting saw no possibility of company managers sympathizing with such a forced entree. However, a number of Pittsburgh executives were present, so possibly this situation will improve.

Besides National President Archer and Secretary Eisenman, many other transient visitors were present. The meeting was very well attended.

Burns Talks on Corrosion

Reported by G. K. Dreher

Milwaukee Chapter, Dec. 19—Dr. R. M. Burns of the Bell Telephone Laboratories lectured on "Corrosion and Its Prevention" at the usual monthly dinner meeting in the Elizabethan Room of the Milwaukee Athletic Club. The meeting was very well attended.

R. J. Lynch, sports editor of the Milwaukee Journal, gave an informal coffee talk on athletic reporting and related some of the queer experiences which his men run into in pursuit of their profession.

Students Hear About Hi Speed

Reported by D. F. McFarland

Penn State Group, Nov. 21—The second meeting of the season was addressed by Norman I. Stotz, metallurgical engineer of the Cyclops Steel Co., on the subject "High Speed Steels."

Realizing that he was speaking to an audience composed largely of students, Mr. Stotz supplemented his technical discussion with valuable remarks illustrating the problems likely to be met by the young metallurgist entering the industrial field, and explaining economic and practical phases of the subject not usually understood by such a group.

Technical Papers Invited

All members of the Society are cordially invited to submit technical papers to the Publication Committee for its consideration for presentation at the next annual convention, or for publication in *Transactions*, or both.

Information and suggestions for the preparation of manuscripts to be reviewed by the Committee will be sent upon request to the American Society for Metals, 7016 Euclid Avenue, Cleveland, Ohio.

Cranberries & Grain Size Entertain Boston Members

Reported by H. E. Handy

Boston Chapter, Nov. 1—The November meeting was held at Massachusetts Institute of Technology in Cambridge.

A turkey dinner with all the fixings was served at 6:30 to about 115 members. Following dinner, Mr. E. L. Bartholomew, metallurgist, United Shoe Machinery Corp., and past chairman of the Boston Chapter, gave an interesting talk about his hobby, "Cape Cod Cranberries." An extensive grower of cranberries himself, Mr. Bartholomew made an enthusiastic speaker.

Harry W. McQuaid, metallurgical engineer, Republic Steel Corp., was the technical speaker at the evening meeting attended by about 200. He covered the popular subject of "Grain Size in Steel" in a very interesting manner, showing a large number of slides to illustrate his talk. A lengthy discussion followed his presentation.

New Jersey Overflows Hall

Reported by Elton W. Jenkins

New Jersey Chapter, Dec. 9—The fourth regular meeting of the New Jersey Chapter turned out to be a "knock-out" for attendance. The Essex House dining-room was filled to capacity and it was necessary to procure and arrange temporary seating in the lecture hall.

The speaker was Joseph Winlock of the Edward G. Budd Mfg. Co., Philadelphia. His subject, "Stamping, Drawing and Forming Sheet Steel," was well covered and illustrated by moving pictures in addition to the regular slides.

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The questions asked by the pupil during the course of the dialogue lead to many subjects such as red shortness, alloy steels, cold work, high speed steel, corrosion, and stainless steels. Valuable historical material and a complete review of the various theories of hardening steel are included. Bound in cloth, 200 pages, 5 1/2 x 8 in., 12 illustrations.

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Chapter Programs; Secretaries' Addresses

Baltimore—Paul S. Lane, American Hammered Piston Ring Co.
Feb. 10—Open Hearth Melting...T. J. Foulkes
March 9—Stainless Steels.
Boston—H. E. Handy, Saco-Lowell Shops, Biddeford, Me.
Feb. 7—Sodium Cyanide...W. M. Gager
Mar. 6—Low Alloy Steels...A. B. Kinzel
Buffalo—B. L. McCarthy, Wickwire Spencer Steel Co.
Feb. 13—Tool Steels...J. P. Gill
Mar. 12—Progress in Steel Industry...R. S. Archer
Canton—Massillon—W. J. Buechling, Republic Steel Corp.
Feb. 13—Corrosion...Frank La Que
Feb. 28—Mid Winter Frolic
Mar. 19—Stainless Steel...Motion Picture
Chicago—K. H. Hobbie, Driver-Harris Co., 1140 Washington Blvd.
Feb. 13—High Temperature Alloys...F. B. Foley
Mar. 12—Inspection Methods...A. V. DeForest
Cincinnati—Kurt Siems, Cincinnati Milling Machine Co.
Feb. 12—Machinability...J. V. Emmons
Mar. 11—Heat Resisting Alloys...S. L. Hoyt
Cleveland—Gordon T. Williams, Cleveland Tractor Co.
Feb. 3—Low Alloy Steels...A. B. Kinzel
Mar. 2—Forgings...J. H. Friedman
Columbus—L. H. Marshall, 2525 N. High St.
Feb. 10—Machinability...J. V. Emmons
Mar. 9—Heat Resisting Alloys...S. L. Hoyt
Dayton—Fred M. Reiter, Dayton Power & Light Co.
Feb. 11—Machinability...J. V. Emmons
Mar. 11—Heat Resisting Alloys...S. L. Hoyt
Detroit—E. B. Drake, 4841 Cass Ave.
Feb. 10—Materials for Automotive Power Units...W. H. Graves
Automotive Radiators (Non-Ferrous)...J. D. Harris
Mar. 9—Die Rolled Shapes...Grover Eads
Hot Rolled Bars...Walter Hildorf
Physical Testing (Non-Ferrous)...Dexter Mead
Golden Gate—R. S. Hirst, 2142 Ward St., Berkeley, Calif.
Hartford—H. J. Noble, Pratt & Whitney Aircraft Co.
Feb. 11—Carburizing...H. W. McQuaid
Mar. 10—Heat Treatment...E. S. Davenport
Indianapolis—R. A. Thompson, Electric Steel Castings Co.
Feb. 17—High Speed Steel...J. P. Gill
Mar. 16—Sheet Steel...R. L. Kenyon
Lehigh Valley—L. H. Scheifele, Reading Co., Reading, Pa.
Feb. 7—Molybdenum High Speed Steel...J. V. Emmons
Mar. 6—Controlled Atmospheres...J. E. Hines
Los Angeles—S. R. Kimberly, Los Angeles Steel Casting Co., 2444 S. Alameda Ave.
Feb.—Oil Refining Equipment
Milwaukee—W. J. Sparling, Chain Belt Co.
Montreal—B. W. Brownrigg, P. O. Box 371, Station H.
Feb. 3—Reinforced Concrete Pipe...R. W. Mitchell
Centrifugal Cast Pipe...W. J. Langston
Mar. 3—Testing for Railways...R. K. Linagh
Muncie—L. W. Murray, Delco-Remy Div., Anderson, Ind.

Gill Draws Record Crowd For Address at Rochester

Reported by E. W. Moore

Rochester Chapter, Dec. 9—Dinner was served at 6:15 to members and guests, after which Colonel H. R. Smalley, Cavalry, U. S. Army, spoke very interestingly on the conditions and requirements of the U. S. Army as compared with those of other countries.

J. P. Gill, chief metallurgist of the Vanadium-Alloys Steel Co., delivered the main address of the evening on "Carbon and Low Alloy Tool Steel." The largest turn-out in three years heard him speak, which is ample evidence of his ability and popularity.

The gist of Mr. Gill's talk, which covered the chemical composition, structure, and physical characteristics of the widely used types of carbon and low alloy tool steels, has already been reported in THE REVIEW. Lantern slides were used to show the effects of small changes in percentage of alloying elements on the various physical properties of the steels.

During the discussion period Mr. Marshall's questions brought out the fact that alloy tool steels should be used where toughness is required, rather than temper the straight carbon steels; the latter should not be drawn below Rockwell C-60.

Mr. LeClair raised some points about cementite, annealing temperatures, and "grain size" of tool steels, and I. C. Matthews asked about retained austenite and its transformation in high speed steels.

Mr. C. E. Codd asked whether fast finishing steel or high speed steel was best for brass rod. Fast finishing steel was recommended but must be run at lower speeds and feeds.

New Haven—J. F. Sargent, R. Wallace & Sons Mfg. Co., Wallingford, Conn.
Jan. 23—Copper Alloys...D. K. Crampton
Feb. 20—Furnaces and Atmospheres...Mr. Benzinger
Mar. 19—High Temperature Materials...V. T. Malcolm
New Jersey—J. H. Johnson, Jos. T. Ryerson & Sons Co.
Feb. 10—Grain Size Control...E. C. Bain
Mar. 9—Sheet Aluminum...C. F. Nagel
New York—T. N. Holden, 1219 Glenwood Rd., Brooklyn
Feb.—Steel Melting...Alexander Field
Mar. 16—Coatings on Metal...Colin G. Fink
North West—Alexis Caswell, Manufacturers' Association of Minneapolis
Feb. 11—Grinding...H. W. Dunbar
Mar. 10—Quality Steels...H. W. McQuaid
Notre Dame—Walter C. Troy, 9 Corby Hall, University of Notre Dame
Ontario—L. F. Fitzpatrick, 349 Carlaw Ave., Toronto
Feb. 7—Structure of Metals...V. N. Krivobok
Mar. 6—Aircraft Metallurgy
Penn State—D. F. McFarland, Pennsylvania State College, Pa.
Peoria—J. W. Bridwell, Caterpillar Tractor Co.
Feb. 10—Armco Ingot Iron...R. L. Kenyon
Mar. 9—Machine Tools...Sol Einstein
Philadelphia—A. O. Schaefer, The Midvale Co.
Jan. 31—Sheet and Strip Steels
Feb. 28—Hardening of Steel...H. J. French
Mar. 27—Silicon-Copper Alloys...W. B. Goudielock
Pittsburgh—H. L. Walker, Box 6621
Feb. 13—Aircraft Materials...J. B. Johnson
Mar. 12—Bearing Metals...E. R. Darby
Rhode Island—C. G. Peterson, Providence Gas Co.
Rochester—I. C. Matthews, Eastman Kodak Co.
Feb. 10—Competition Among Metals...E. H. Dix
Mar. 9—Stainless Steels...V. N. Krivobok
Rockford—Alan Mattison, Mattison Machine Works
Schenectady—Lyal Zickrick, General Electric Co., Research Laboratory
Feb. 11—Nitriding...V. O. Homerberg
Mar. 17—Sheet Steel...R. L. Kenyon
Southern Tier—K. J. Mackenzie, International Business Machines Corp., Endicott, N. Y.
Mar. 23—Cast Iron...O. Smalley
Springfield—A. W. Morris, 54 Buckingham St.
Feb. 17—Testing of Materials...B. L. Lewis
Mar. 9—Hardening of Steel...E. S. Davenport
St. Louis—G. J. Moeller, Ramsey Accessories Mfg. Corp.
Syracuse—R. K. Warren, Crucible Steel Co.
Feb. 11—Large Forgings...A. O. Schaefer
Mar. 10—...J. A. Succop
Tri-City—R. H. Lind, Peoples Light Co., Davenport, Iowa
Feb.—Welding
Washington—E. F. Wilson, Naval Gun Factory
Worcester—G. A. Peterson, Pratt & Inman
Feb.—Fatigue Failures...J. H. Zimmerman
York—C. M. Strickler, General Machine Works, Lamour and Prospect Sts.
Feb. 5—Stainless Steel...Lawrence Hicks
Mar. 4—Non-Ferrous Casting

Modern Furnaces Far Better Than Those of 2 or 3 Years Ago

Reported by E. F. Bicknell

Tri-City Chapter, Dec. 10—Ernest G. DeCoriolis, research engineer, Surface Combustion Corp., Toledo, spoke to 75 members of the Chapter at the Rock Island Arsenal auditorium.

Mr. DeCoriolis, co-inventor of the process of diffusion combustion, spoke on "Modern Furnaces," and stressed the point that the modern atmospheric controlled furnace of today is far in advance of the furnaces built only two and three years ago.

As the "coffee speaker," George Duval, Jr. of the Mississippi Airways, Inc. gave an interesting talk on the design and construction of the China Clipper, and told of the part that heat treatment of aluminum alloys played in the construction of these large planes.

High Speed Steel Prices Are Given

Reported by Ralph Leiter

Philadelphia Chapter, Nov. 22—An enthusiastic audience of some 250 members and guests was treated to a fine lecture on "The Latest Trends and Developments in High Speed Steel." The speaker, Norman I. Stotz, gave a complete and clear presentation of the subject.

Mr. Stotz covered the properties and uses of the various modifications of regular, super and molybdenum high speed steels. A feature of the lecture that received many favorable comments was the inclusion of the price per pound of the more important steels. Economics very definitely has a place in modern metallurgy and is too frequently neglected in technical papers.

During the discussion Francis Foley of Midvale pointed out the interesting fact that a tool quenched and drawn to produce maximum hardness usually does not have the cutting efficiency of a tool drawn at a higher temperature—about 1100° F. Mr. Foley suggests that with too high a hardness the tool breaks down by microscopic spalling of the tip.

Other important information was brought out in the discussion:

The quenching of regular high speed steel from 2100° F. results in a tool of fair cutting efficiency if carbides are distributed uniformly. It is not a dependable quenching temperature.

The time at hardening temperature is very critical for molybdenum high speed steel. At 2200° F., a 3/4-in. diameter tool must be held at temperature at least 1/4 min. and not over 3/4 min. The leeway is slightly greater at a lower temperature and for larger diameter tools. For regular high speed steel the time allowable is about twice as great.

The torsion-impact test is considered very valuable but not too well understood. Super high speed steel containing cobalt was recommended for cutting 18-8 stainless steel.

In a dinner speech on "Crime and Criminals" Dr. Louis Robinson named the various types of criminals and gave fascinating life stories illustrating each.

Nitricastiron Gives Good Results, Has Bright Future

Southern Tier Chapter, Nov. 18—In spite of a severe storm 47 members and guests were present at the dinner. The meeting immediately following was extremely interesting.

The speaker was Dr. V. O. Homerberg of Massachusetts Institute of Technology, also research director for the Nitralloy Corp. He talked on "Nitriding and Its Practical Application," a subject he is well qualified to discuss.

Dr. Homerberg gave a history of the development and outlined the many present-day possibilities in nitriding. One of the most interesting was Nitricastiron, a recent development of cast iron which can be nitrided. Very excellent results have been obtained with this material and Dr. Homerberg predicted a bright future for it.

His talk was accompanied by lantern slides illustrating the points he desired to stress.

High Heat Alloys Surveyed In Comprehensive Manner

Reported by Gordon T. Williams

Cleveland Chapter, Nov. 4—Dr. V. N. Krivobok of Carnegie Tech and Allegheny Steel Co., addressed the Chapter on "Steels for High Temperature Application" at the third meeting of the season.

The complex field of high heat alloys was surveyed in a comprehensive view, and the more important commercial alloys briefly appraised. Mechanical properties, corrosion, and internal changes were commented upon.

Vigorous discussion which followed the conclusion of Dr. Krivobok's talk showed the keen interest of the listeners. The good doctor thoroughly pleased the large and attentive audience with his forceful and brilliant manner, his nimble wit, and his engaging personality.

Dinner attended by 125, preceded the technical address. The coffee talk was given by W. C. Westphal, Supervisor of Labor Relations in Cuyahoga County for the W.P.A.; in an interesting talk punctuated by anecdotes he explained the history, plans and policies of the W.P.A.

Non-Technical Discussion Of Cast Iron Is Presented

Reported by Walter C. Troy

Notre Dame Group, Dec. 11—Hyman Bornstein, of the Testing and Research Laboratories of Deere and Co., was guest speaker at the December meeting, held in the Engineering Auditorium at University of Notre Dame. His topic was "Cast Iron and Its Heat Treatment."

The speaker presented a practical discussion and, without once mentioning such technical terms as eutectic or dendrite, presented an accurate and valuable talk. In the opening remarks devoted to developments in foundry practice, American practice was shown to be acquiring a superiority over European.

Cast iron was defined as "alloys of iron, silicon and carbon containing so much carbon that they are not ordinarily malleable as cast." Mr. Bornstein described the physical structure of gray iron and indicated the effects of impurities on the microstructure. The major part of the talk pertained to heat treatment of alloy irons.

Dr. Mahin, head of the Metallurgy Department at Notre Dame, extended an invitation to inspect the laboratories of the department, and all who did so were very favorably impressed with the facilities available.

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Members who wish to preserve Vol. XXIII of Transactions in bound form should send their copies to National Headquarters together with \$2 which covers the cost of binding in blue cloth to match previous bound volumes.

If any member wants to keep his copies of the issues of Vol. XXIII, January through December, 1935, in loose form and yet have a bound volume for his library, a complete bound volume will be supplied for \$5, postpaid.

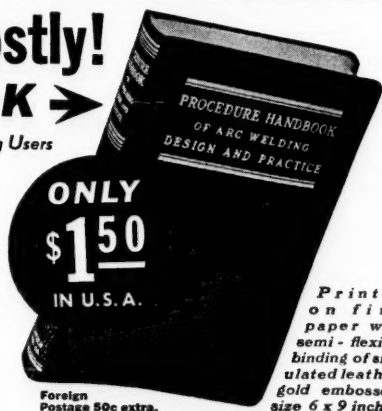
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Cast Iron Defined and Classified; Alloy Irons Require Special Design

Reported by J. P. Ahlbrandt

Chicago Chapter, Dec. 12—This was one of the most interesting meetings of the Chicago Chapter season. There were 265 members and guests in attendance to hear Hyman Bornstein present a talk on "Cast Iron and Its Heat Treatment," on which he is a recognized authority.

The subject was presented in a language easily understandable to all laymen present and covered the effect of the alloying elements, heat treatment, and engineering properties. Slides were used to illustrate each group, showing structure, physical properties, and industrial applications.

Cast iron was defined and divided into six classifications ranging from pig iron to special or high strength irons. Various melting furnaces were described, including the cupola, electric,

air, Brackelsburg, and combinations. Comparison of the processes was made on a cost and quality basis.

The effect of alloying elements such as nickel, chromium, molybdenum, vanadium and copper was described with particular reference to texture, machinability, and corrosion resistance. The speaker stated that for most of the uses today ordinary cast iron will suffice and that special designing is necessary to attain maximum benefits from alloy irons.

According to Mr. Bornstein, the heat treatment of these irons has developed tremendously in the past few years, and they are as susceptible to heat treatment as steel, although because of brittleness in quenching, it has been confined to simple shapes.

A wide range of engineering properties of cast iron includes endurance, heat resistance, machinability and mass effect, and dampening power similar to that of rubber. The specifications of the Ford crankshaft were submitted, so that those present could decide for themselves whether it was cast iron or steel.

Large Use of Stainless In Chemical Industry Dates Back Ten Years

Reported by L. S. Bergen

New York Chapter, Dec. 16—Dr. H. L. Maxwell, chief metallurgist of E. I. du Pont de Nemours & Co. addressed the Chapter on "Stainless Steel in the Chemical Industry."

The first large-scale use of stainless by the chemical industry was the installation of equipment for ammonia oxidation ten years ago, using straight 18% chromium steel. It was thought necessary at that time to use great care in the processing and driving of the rivets so as to prevent any tendency toward brittleness. Dr. Maxwell stated that such progress has been made in stainless steel manufacture in the meantime that not only are all worries about brittleness in riveted construction eliminated, but many welded installations of 15 to 18% chromium steel are giving perfectly satisfactory service.

Careful tests of materials under con-

ditions as nearly identical with service conditions as possible are necessary. First cost is not necessarily the most important—the controlling factor is the lowest production cost per month or per year of the product under consideration. An example of this was the choice of a corrosion resisting material in the manufacture of urea. Tests simulating the expected conditions were run, and a small pilot plant built of the most promising material, which allowed tests under actual processing conditions. On the basis of results with this pilot plant, equipment involving tanks as large as 8 ft. in diameter and 30 ft. long made of 3/4-in. plate have been made and are now in successful operation.

Dr. Maxwell stated that the use of an alloy cast iron for increased resistance to corrosion in various media has proven desirable and economical under certain conditions. Nickel, Monel metal and Inconel have been used for certain applications with great success.

A lively discussion followed Dr. Maxwell's address and the evening was concluded by the usual social hour around a table of beer and pretzels.

These Helpful Bulletins Will Be Sent Free on Request

Wide-Strip Pyrometer

Full details of the many important features incorporated in the Bristol Co.'s new wide-strip potentiometer pyrometer with simplified measuring, self-balancing, and self-standardizing mechanism are contained in Bulletin Jya-87.

Laboratory Microscopes

A catalog by Bausch & Lomb Optical Co. lists, describes and gives applications of laboratory microscopes. Accessories and illuminating systems are also fully described and a price list is included. Bulletin Jya-35.

Reducing Operating Costs

A folder by Brown Instrument Co. illustrates and briefly describes the advantages of using Brown Instruments for reducing costs in boiler room and plant process. Bulletin Jya-3.

Carburizing Retorts

Low cost, flexibility, uniformity, control, quality, and less labor with retort gas carburizing, says American Gas Furnace Co. Rotary, vertical and bell type retorts are described in Bulletin Jya-11.

Gas-Fired Cyclone

Lindberg Steel Treating Co. has announced a gas-fired cyclone furnace as a companion to the electric cyclone. Complete data in the form of diagrams, charts, photographs, and blueprints are found in a new catalog. Bulletin Jya-66.

Welding Electrodes

Electrodes for welding alloy steel, particularly "Cor-ten" steel, used for railroad cars and outdoor structures, are described in Metal & Thermit's new booklet. Bulletin Myx-64.

Liquid Carburizing

E. F. Houghton's Perlitol liquid carburizer is the subject of a 23-page booklet. Depth of case, speed of penetration, and other results are well illustrated with graphs and photomicrographs. Bulletin Nv-38.

Resistor Furnaces

Hevi Duty Electric Co. announces the first of a line of industrial furnaces using metallic resistor elements, permitting operating temperatures to 2300° F. in either oxidizing or reducing atmospheres. Bulletin Ax-44.

Stainless Slide Chart

Carpenter Steel Co.'s pocket-size slide chart gives at a glance the technical data on all stainless steels. Bulletin Jyx-12.

Multi-Color Records

A handsome booklet describing Foxboro's multi-color potentiometer recorder for 2, 3, 4, or 6 temperatures reproduces charts in actual color. Specifications for one model are given. Bulletin Myx-21.

S.A.E. Steels

The advantages of cold drawing in raising tensile strength and yield point are given in Union Drawn Steel Co.'s folder. It is accompanied by a copy of the newly revised S.A.E. steel specifications. Bulletin Jyx-83.

Oxwelding Stainless

Linde Air Products Co. has published a handbook of instructions for successfully welding corrosion resisting steels by the oxy-acetylene process. Welding procedures and weld treatments are carefully explained. Bulletin Jy-63.

Heat in Industry

"Wherever Heat Is Used in Industry" is the title of Surface Combustion Corp.'s new booklet which starts with "Surface Combustion" principles and shows a part of various types of standard burners and furnaces and special furnaces. Bulletin Dx-51.

Progress in Pipe

A 16-page, 2-color folder released by Republic Steel Corp. lists and describes the various types of tubular products manufactured by Republic and its subsidiary, Steel & Tubes, Inc. It is indexed for added convenience. Bulletin Dx-8.

Aluminum Alloys

Working facts on aluminum—the properties and heat treatment of both cast and wrought alloys—are briefed for the manufacturer and designer in a booklet by Aluminum Co. of America. An appendix gives tables of physical properties, forms and sizes available. Bulletin Dx-54.

Alloy Castings

A new bulletin on corrosion and heat resisting alloy castings is offered by Michiana Products Corp., manufacturers of Fire Armor and Zorite and other heat and acid resisting castings. Bulletin Jyx-81.

Hardness Conversions

International Nickel Co. has a handy, celluloid, vest-pocket-size hardness conversion table, which quickly gives approximate relation between Brinell, Rockwell and Shore hardness values and corresponding strengths of nickel alloy steels. Bulletin Nx-45.

Castings for High Heat

The compositions, properties and uses of Driver-Harris Co.'s Nichrome, Chromax, and Cimet, and other alloys for high temperature and corrosion resistance are given in a new illustrated folder. Bulletin Nx-19.

Metallographic Methods

"WACO Service" suggests application of the newer methods to daily routine. Included are the new bakelite specimen mount, low cost polishers and grinders, and an offer of sample Selvyt polishing cloth. Wilkens-Anderson Co. Bulletin Ox-7.

Optical Pyrometer

A simplified optical pyrometer which is compact, easy to operate, light, and entirely self-contained is invaluable in iron and steel manufacturing plants, heat treating, forging, rolling, and wire drawing plants. Such an instrument is marketed by Pyrometer Instrument Co. and is fully described in Bulletin Ox-37.

Nickel-Copper Steels

Exceptional resistance to corrosion and abrasion, increased tensile strength, and higher ductility are the qualities claimed for Youngstown Sheet & Tube Co.'s new series of Yoley steels. A summary of properties and notes on their characteristics are contained in Bulletin Ox-93.

Vanadium Facts

Revived after nearly 20 years is the house organ of Vanadium Corp. of America, "Vanadium Facts." This paper shows considerable thought and care in its preparation and contains valuable and interesting information on vanadium steels. Bulletin Ox-27.

Rotoblast

A new blast cleaning machine eliminates the need for compressed air as the abrasive driving agent. Pangborn Corporation tells how a rapidly spinning wheel propels the abrasive by controlled centrifugal force. Bulletin Ox-68.

Fast-Cutting Steel

Bliss & Laughlin, Inc. offer an interesting technical folder on Ultra-Cut Steel, giving performance records of this high-speed screw stock on automatic screw machines. Physical data and microstructures are presented. Bulletin Ob-42.

Spoilage Insurance

C. I. Hayes, Inc. has compiled a record of reports from over 300 users of their "Certain Curtain" controlled atmosphere furnaces showing how these furnaces have cut down spoilage in the heat treatment of tools and parts. Bulletin Sx-15.

Conveyor Furnaces

Continuous chain belt conveyor furnaces handle miscellaneous parts without pans or trays—they are efficient, uniform, and flexible in operation. Improved furnaces of this type are described by Electric Furnace Co. Bulletin Axx-30.

Kanthal Alloys

C. O. Jelliff Mfg. Co. offers a descriptive booklet on Kanthal alloys. Certain of these alloys may be used as resistance elements; others are for furnace parts or other heat resisting applications. Full details are given in Bulletin Jy-78.

Silico-Manganese Steel

Silico-Manganese steel for heavy duty springs is the subject of Bethlehem Steel Co.'s new folder giving its properties and recommendations for heat treatment. Bulletin Jyx-76.

Burners and Valves

Auxiliary equipment for industrial furnaces that will insure proper heat production and correct combustion, such as oil and gas burners, blowers, regulating and shut-off valves, is fully described in Mahr Mfg. Co.'s illustrated booklet. Bulletin Jyx-5.

Metallograph

A new 36-page booklet of E. Leitz, Inc., contains all information on the Leitz large Micro-Metallograph MM 1. Excellent photomicrographs are reproduced to show its capacity. Special attention is given to the darkfield illumination feature. Bulletin Se-47.

Tantalum

"A rare metal with amazing properties of heat and electrical transference, corrosion, and wear resistance"—The manifold commercial possibilities of tantalum are interestingly told in a 48-page booklet by Fansteel Metallurgical Corp. Bulletin R-154.

Heat Treating Manual

A folder of Chicago Flexible Shaft Co. contains conveniently arranged information on heat treating equipment for schools, laboratories and shops, and also illustrates the several types of Stewart industrial furnaces. Bulletin Ar-49.

Rockwell Tester

The Rockwell Superficial Hardness Tester is applicable to far thinner sheet and strip than the regular Rockwell. Its use for nitrided and case hardened parts is also described by Wilson Mechanical Instrument Co. in Bulletin Myx-22.

Neophot

"Neophot" is the name of a new metallograph of radically new design and universal adaptability. A pamphlet distributed by Carl Zeiss, Inc., gives its applications and features and is well illustrated with beautiful samples of micrographic work. Bulletin Jx-28.

Testing with Monotron

Shore Instrument & Mfg. Co. offers a new bulletin on Monotron hardness testing machines which function quickly and accurately under all conditions of practice. Bulletin Jy-33.

Turbo-Compressors

The new items in Spencer Turbine Co.'s bulletin are a new and smaller "Midget" turbo for individual mounting, a single-stage line which effects new economies, and the gas-tight turbos for acid and explosive gases. Bulletin Mx-70.

Ni-Cr Castings

Compositions, properties, and uses of the high nickel-chromium castings made by The Electro Alloys Co. for heat, corrosion and abrasion resistance are concisely stated in a handy illustrated booklet. Bulletin Fx-32.

Big-End-Up

Gathmann Engineering Co. briefly explains the advantages of steel cast in big-end-up ingots, showing the freedom from pipe, excessive segregation and axial porosity. An 82% ingot-to-bloom yield of sound steel is usual. Bulletin Fe-13.

Heat Resisting Alloys

Authoritative information on alloy castings, especially the chromium-nickel and straight chromium alloys manufactured by General Alloys Co. to resist corrosion and high temperatures, is contained in Bulletin D-17.

Moly Matrix

Climax Molybdenum Co.'s little monthly newspaper contains many interesting and informative articles. Get the latest issue—Bulletin Ax-4.

Centrifugal Compressors

B. F. Sturtevant Co. has a line of centrifugal compressors designed particularly for industrial furnace applications. These are illustrated and described in Bulletin Myx-58.

The Review, 7016 Euclid Ave., Cleveland

Please have sent to me without charge or obligation the following literature described in the January issue. (Please order by number only.)

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Electric Heat

The certainty of results obtained with electric heat is economically available in automatically controlled electric furnaces. Hoskins Mfg. Co. has a catalog stressing the advantages and low-cost maintenance of their line of furnaces. Bulletin Jya-24.

Bench Type Furnace

American Electric Furnace Co. has a new bulletin describing their new bench-type electric furnace for low cost, high speed hardening. It can be used for all types of high speed steel. Bulletin Jya-2.

Ferro-Alloys

An interesting folder by Electro Metallurgical Co. tells all about their ferro-alloys and their special service to users which will help them to operate their furnaces and make alloy additions under the proper conditions. Bulletin Jya-16.

Centricast Boxes

The story of centrifugally cast carburizing and annealing boxes—their reason for being, method of production, properties, and advantages—is made extremely readable in a folder by Michigan Steel Casting Co. Bulletin Jya-84.

Sicromo Steel

Timken Steel & Tube Co. has developed Sicromo steel for applications requiring a reasonable degree of resistance to both corrosion and oxidation on an economic basis. Complete technical information, tables and curves are given in a set of data sheets. Bulletin Jya-71.

Electrical Measurements

Leeds & Northrup instruments for electrical measurements meet the needs of research, teaching and testing for dependable service combined with economy. All types of standard and special apparatus are described in a compact and comprehensive listing. Bulletin Jya-46.

Prince of Steels

The Chemical Foundation has for distribution a beautifully printed and illustrated book which dramatizes the story of stainless steels. Many interesting little-known facts are told and unusual applications listed. Bulletin Jya-113.

Recuperators

Results obtained with Carborundum Company's recuperators using Carbofrax tubes are fuel savings, closer temperature control, faster heating, and improved furnace atmosphere. Complete engineering data regarding application to various types of furnaces are given in Bulletin Fx-57.

Welding Copper

Procedure for welding with the high voltage carbon arc is described and illustrated by American Brass Co. Physical test data on welded specimens and a brief description of 17 Anaconda welding rods are included. Bulletin Jya-89.

No-Contact Control

A book that should be in the hands of every man interested in temperature reading and control is the Data Book published by Thermo Control Devices, Inc., which describes a line of indicating and controlling pyrometers with Wheelco no-contact system of control. Bulletin Dx-110.

E. C. Bain Reports Interest Abroad In Grain Control

Reported by F. H. Clark

New York Chapter, Nov. 21, was fortunate in having Mr. Edgar C. Bain of U. S. Steel Corp., A.S.M. vice-president, speak on "Grain Size of Steel." Mr. Bain has recently returned from an extensive trip in Germany and Sweden, and reported about as much interest in those countries in the control of grain size as in America.

The chief factor in grain size control is believed today to be the addition of alumina in the killing of steel. This is probably because the fine alumina particles form many nuclei during the temperature period from solidification down to the hardening range. Recent investigations indicate that there are other influences at work, such as the effect of aluminum in the presence of oxygen, and the effect of silica.

Grain size studies of steel refer to austenite at elevated temperatures in steels with more than 0.35% carbon and an alloy content of not over 4%. Photomicrographs illustrated methods of determining grain size, such as quenching to produce troostite at grain boundaries of martensite. A new method developed by Mr. Vilella of U. S. Steel Corp. Laboratories shows grain size in pure martensite by a special etching with hydrochloric and picric acids. Mr. Bain believes that grain size can be determined for all steels if sufficient investigations are made.

The McQuaid-Ehn test, according to Mr. Bain, is satisfactory as a test for carburizing but the use of the word "abnormality" is an unfortunate one. In general, fine grains are associated with shallow hardenability and abnormality.

Coarseness, on the other hand, is associated with easily acquired quenching and grinding cracks. It is satisfactory for steels in commercial practice that will be given heavy cuts.

In the discussion that followed, Mr. Vanick asked the relation of grain size to internal stress. Mr. Bain replied that he did not know the answer nor could he show any relationship between corrosion and grain size.

Mr. McMullen asked the effect of grain size on the coarsening temperatures of steels during hot working. Mr. Bain replied that it was a contributing factor.

In conclusion, Mr. Bain said that metallurgists had placed so much emphasis in the past on steels which had high strength combined with high ductility, that certain advantages of coarse grain had been overlooked.

Plant Trip and Stainless Feature N. H. Meeting

Reported by L. E. Raymond

New Haven Chapter, Nov. 21—The November meeting began in Naugatuck about 3:00 p. m. when the Chapter descended upon the melting department of the Eastern Malleable Iron Co. Considerable interest was shown in the different methods of melting and malleableizing, especially in the Brackelsburg melting furnace and the short time malleableizing process.

The members then transferred their activity to The Bristol Co. in Waterbury where a turkey dinner was served and the technical session held. A. D. Eplett, technical chairman, introduced the speaker, Dr. R. P. DeVries, director of research of Ludlum Steel Co. He gave a complete discussion of stainless steels from the user's viewpoint, explaining in detail various fabrication difficulties which might be encountered and possible remedies.

The first report of the Current Developments Committee on recent developments in the field of temperature control was made at this meeting. Henry Keshian of The Chase Companies is chairman of this Committee.

Boston Gear Works Visited For Dec. Chapter Meeting

Reported by H. E. Handy

Boston Chapter, Dec. 6—A plant visitation at the Boston Gear Works, North Quincy, Mass., was the feature of the meeting. During the afternoon about 200 members and guests had the opportunity of being conducted through this interesting plant, which is an important producer of gears and power-transmission machinery.

Dinner was served at the Wollaston Masonic Temple and was followed by an address by one of the Boston Gear Works officials on the work being done by that company. A motion picture entitled, "Tool Steel and Tools," produced by Crucible Steel Co. of America was also shown at dinner.

The guest speaker was Sam Spalding, assistant metallurgist of the American Brass Co., and trustee-elect of the American Society for Metals. His subject was "Tool Steels," and has been previously reported in THE REVIEW.

A long and interesting discussion followed his address.

Crown Rheostat Adds to Force

Crown Rheostat & Supply Co., sustaining members of the Chicago Chapter, have added to their staff C. E. Clindinin, who will be in charge of the laboratory and service work. C. E. Stiers has been added to the sales force.

Lack of Discussion Deplored, Milwaukee Chapter Responds

Reported by G. K. Dreher

Milwaukee Chapter, Nov. 22—At the usual monthly meeting, the Chapter played host to National President R. S. Archer, who, in turn, delivered a very interesting lecture on the "Economics of Present-Day and Future Metallurgy."

Mr. Archer unwittingly had publicly deplored the lack of discussion which seemed to prevail at present-day meetings. His challenge was immediately accepted by Dr. S. L. Hoyt and A. B. Kinzel to the tune of a very lively discussion. Mr. Kinzel, who was present as a guest, compared some of President Archer's statements with European economics in a very interesting manner.

At the dinner R. S. McIntyre, sports editor of the Milwaukee Sentinel, discussed the football situation in the Midwest in a very enjoyable talk.

Low Alloy Structural, S.A.E., And Tool Steels Described

Reported by B. R. Queneau

Northwest Chapter, Nov. 22—According to custom, a special entertainment started the November meeting. This consisted of motion pictures, entitled "Hunting and Fishing in Minnesota" taken by the State Conservation Department. They proved of great interest to all sportsmen present.

A. B. Kinzel, chief metallurgist of Union Carbide and Carbon Research Laboratories, gave a very fine talk on "Low Alloy Steels." The alloying elements were divided into the carbide-formers, deoxidizers, and those that promote the retention of austenite. The steels were also subdivided into three groups—the structural steels, S. A. E. steels, and tool steels—and the effects of the different alloying elements were discussed quite fully. The method of presentation brought out the high points clearly, and Mr. Kinzel is certainly to be complimented on a very useful talk.

Stainless Lacks Design Background for Aircraft

Reported by E. J. Tompkins

Chicago Chapter, Nov. 14—J. B. Johnson, chief of the Material Branch, Wright Field, Dayton, Ohio, addressed an excellent attendance at the November monthly meeting. He dealt with recent developments in alloys for the modern airplane.

His talk has already been reported in THE REVIEW, but of particular interest was his statement that such steels as 18-8 could probably be successfully used if the design background were available. Since great amounts have been spent on development of aluminum alloys, and applications are based on actual experience rather than theory, stainless and special steels run a poor second as airplane fabricating materials.

It was also pointed out that Magnaflex testing of light sections often brings out defects that are entirely missed by the X-Ray.

J. F. Calef, of Automatic Electric Co. was technical chairman. As a curtain riser, the American League talking picture on baseball, as sponsored by Lou Fonseca, received very kind comments and was of real interest.

N. D. Has Large Attendance

Reported by Walter C. Troy

Notre Dame Group, Nov. 13—The Group's second meeting of the school term was greeted by one of the largest attendances in several years. The guest speaker was J. B. Johnson, chief of the Material Division of the U. S. Army Air Corps.

The anticipated discussion of his topic, "Light Alloys Used in Aircraft," was thought to be responsible for the large attendance, which included students and faculty members of the University and many of the technical men from South Bend and vicinity.

(His talk has already been outlined in previous issues of THE REVIEW.)

Discuss Springs From Material & Design Viewpoint

Reported by Richard R. Kennedy

Dayton, Cincinnati, and Columbus Chapters, December meetings—F. P. Zimmerli of Barnes-Gibson-Raymond, Inc., was the principal speaker; his subject was "Springs From a Material and Design Viewpoint."

Mr. Zimmerli described the production of oil tempered, valve spring, and music wire. All grades are patented by heating to 1800° F. and quenching in a lead bath at 900 to 1100° F. The subsequent cold drawing and annealing operations determine the types of wire.

A number of materials are available for helical springs. Cold drawn carbon steel wire is frequently used for light springs, and does not require heat treatment other than a stress relief anneal at a low temperature after coiling. For larger springs S.A.E. 1095, chromium-vanadium (6150), silicon-manganese (9260) and others are widely used. These must be hardened and drawn after coiling.

Chief causes of spring failure are overstress (frequently due to incorrect design), surface defects, decarburization, heat treatment, corrosion and plating embrittlement. Springs should be cleaned by sand blasting rather than by pickling before plating and should be baked at about 375° F. after plating to remove embrittlement which has taken place.

Interesting discussions followed the meetings. It was brought out that vibration, particularly surging, causes rapid failure of valve springs, due to local overstress. Valve spring dampeners have little value in overcoming surging.

Swedish acid open-hearth steel is generally used for valve springs. Basic electric steel made in America is equal in every respect to Swedish steel and is even cleaner, but is more expensive. Questions were asked about the effect of surface condition on spring life. Decarburization has no effect on static loading. Decarburized springs fail due to the low endurance limit of the ferrite on the surface. Decarburization may be prevented in heat treatment by proper furnace atmosphere control.

The failure of the heat treated spring wire used for the Mt. Hope and Ambassador bridges was discussed. Had lower heat treating temperatures been used to eliminate coarse grain, this wire might have been as satisfactory as cold drawn wire.

The relative merits of various types of spring steel were also discussed. As a special feature of the Dayton meeting, the members were privileged to inspect the spring division of the Delco Products Corp. in which they witnessed the coiling and heat treatment of various types of springs.

Gathmann Engineering Co. Is Host to Baltimore Men

Reported by J. N. Ostrofsky

Baltimore Chapter, Dec. 9—The third monthly meeting was held at the offices of the Gathmann Engineering Co., Catonsville, Md.

The first feature of the evening was the motion picture "Steel and Tools" obtained for us by H. C. Ballard of Crucible Steel Co. of America. This recent movie follows the processing and inspection of specialized steels through the plants of the company. The continuity and photography are unusually good and other chapters will do well to try to obtain it.

Host Emil Gathmann, president of the Gathmann Engineering Co., then talked briefly on new developments in casting practice.

Later, while refreshments were enjoyed, the visitors had an opportunity to inspect the various exhibits housed in this building. These include large split ingots cast in various molds, working models of ingot strippers, and some of the early wax ingots used in developing the now familiar big-end-up ingot mold.

Employment Service Bureau

Address answers care of A. S. M., 7016 Euclid Ave., Cleveland, unless otherwise stated

METALLURGIST who knows how to apply sound scientific and engineering principles for low cost production. Specialist in control of melting, welding, foundry, fabrication and heat treating. 16 years experience in iron, steel and non-ferrous products. Box 1-5.

MELTER FOREMAN: Desires opening leading to position as open-hearth superintendent. Technical education at Carnegie Tech night school. 17 years experience in acid and basic open-hearth, particularly iron oxide control. Box 1-10.

PROFESSOR: Interested in a responsible metallurgical teaching position or industrial development and research work on steel, cast iron, or combustion engineering. Has had considerable consulting practice in these fields. Box 1-15.

TRAINED METALLURGIST: B. S. and M. S., 23, married. Experience in cold charge electric furnace and control lab operation. Box 1-20.

METALLURGIST: B. S. Wayne University, M.S. University of Michigan. At present employed in automobile sheet mill. Desires position in research or development work. Box 1-25.

TECHNICAL GRADUATE: 24, degree of B. S. in metallurgy. At present employed in physical testing department of alloy steel company. Desires opening in company making alloy steel, offering practical mill experience. Box 1-30.

METALLURGICAL ENGINEER: College graduate with 6 years of progressive professional experience in important and responsible physical metallurgical work. Thoroughly qualified to control and supervise either laboratory or heat treat and forging. Box 1-35.

METALLURGIST-CHEMIST: Experience embraces all phases of physical and chemical testing of ferrous and non-ferrous metals and alloys and their heat treatment. Also research and supervision of others. Box 1-40.

POSITIONS OPEN

WANTED: Young men of outstanding personality, good engineering education and some earning experience in industry to train for the position of traveling service engineer for well-known manufacturer of industrial instruments and automatic control equipment. Highest character references required. These positions only open to young men who are prepared to take a very thorough course of training in factory and laboratories of main plant; this course to include one to two years as bench worker in instrument assembly calibration and final test departments. Write stating age, education, experience and rate of pay desired during training period. Box 1-50.

LARGE UTILITY POWER AND HEATING SALESMAN: Positions are open for one or two technical graduates with some experience in sales engineering work who are willing to learn the utility business in the Sales Department with promotion to Power Sales Division. Box 1-55.

TECHNICAL GRADUATE with proven sales ability: Age about 30. Knowledge of and experience with electric heat applications in industry for power sales work with a large utility in the central states. Box 1-60.